

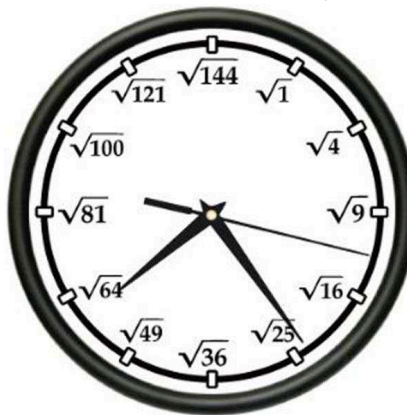
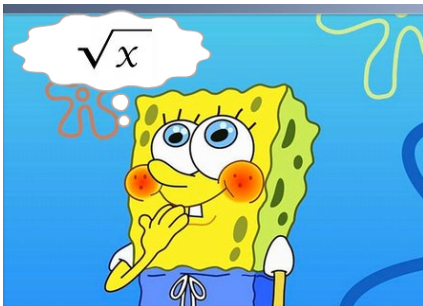
## Chapter 6 Square Roots & the Pythagorean Theorem

### 6.4 Simplifying Square Roots

Unit Question: How do we use signs and symbols to help us?

Learner Profile: Inquirer

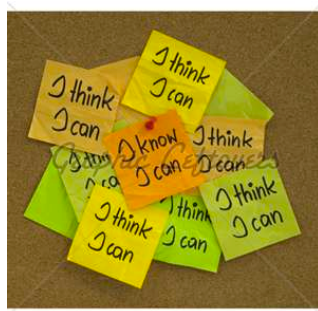
Area of Interaction: Human Ingenuity



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# I Can Statement:

I can simplify square roots.



## Adding Square Roots

Simplify

$$5\sqrt{2} + 4\sqrt{2}$$

$$= (5+4)\sqrt{2}$$

Use the Distributive Property

$$= 9\sqrt{2}$$

Simplify

## Subtracting Square Roots

$$2\sqrt{3} - 7\sqrt{3}$$

$$= (2-7)\sqrt{3}$$

Use the Distributive Property

$$= -5\sqrt{3}$$

Simplify

Simplify the Expression

$$5\sqrt{5} + 5\sqrt{5} \quad (5+5)\sqrt{5} = 10\sqrt{5}$$

$$6\sqrt{10} + 4\sqrt{10} \quad (6+4)\sqrt{10} = 10\sqrt{10}$$

$$2\sqrt{7} - \sqrt{7} = 2\sqrt{7} - 1\sqrt{7} = (2-1)\sqrt{7} = 1\sqrt{7} = \sqrt{7}$$



## Product Property of Square Roots

Algebra  $\sqrt{xy} = \sqrt{x} * \sqrt{y}$

Numbers  $\sqrt{4 * 3} = \sqrt{4} * \sqrt{3}$

## Simplifying Square Roots

$$\sqrt{50}$$

Factor using the  
greatest perfect square

$$\sqrt{50} = \sqrt{25 * 2}$$

$$= \sqrt{25} * \sqrt{2}$$

Use the Property of  
Square Roots

$$= 5\sqrt{2}$$

Simplify

Use factoring to help simplify.

$$\sqrt{50}$$

*Think*

$$50$$

*Now Factor*

$$5 * 10$$

*Prime Factors*

$$5 * 2 * 5$$

*Exponents*

$$5^2 * 2$$

*Take out the squares*

$$5\sqrt{2}$$



Simplify the Expressions

$$\sqrt{24}$$

$$\sqrt{4 \cdot 6} = \sqrt{4} \cdot \sqrt{6}$$

$$2\sqrt{6}$$

$$45$$

$$5 \cdot 9$$

$$3^2 \cdot 3 \cdot 3$$

$$24$$

$$3 \cdot 8$$

$$2 \cdot 2 \cdot 2$$

$$2 \cdot 3$$

$$2 \sqrt{2 \cdot 3}$$

$$\sqrt{45}$$

$$\sqrt{9} \cdot \sqrt{5}$$

$$3\sqrt{5}$$

$$98$$

$$2 \cdot 49$$

$$7 \cdot 7$$

$$\sqrt{98}$$

$$7\sqrt{2}$$

$$2 \cdot 7^2$$

## Quotient Property of Square Roots

$$\sqrt{\frac{x}{y}} = \frac{\sqrt{x}}{\sqrt{y}}, \text{ where } x \geq 0 \text{ and } y > 0$$

## Simplifying Square Roots

$$\sqrt{\frac{11}{16}}$$

$$\frac{\sqrt{11}}{\sqrt{16}}$$

$$\frac{\sqrt{11}}{4}$$

$$\sqrt{\frac{11}{16}} = \frac{\sqrt{11}}{\sqrt{16}}$$

Use the Quotient Property of Square Roots

$$= \frac{\sqrt{11}}{4}$$

Simplify

## More Practice

$$\sqrt{\frac{35}{36}}$$

$$\frac{\sqrt{35}}{\sqrt{36}} = \frac{\sqrt{35}}{6}$$

$$\sqrt{\frac{13}{4}}$$

$$\frac{\sqrt{13}}{\sqrt{4}} = \frac{\sqrt{13}}{2}$$

$$\sqrt{\frac{5}{b^2}}$$

$$\frac{\sqrt{5}}{\sqrt{b^2}} = \frac{\sqrt{5}}{b}$$

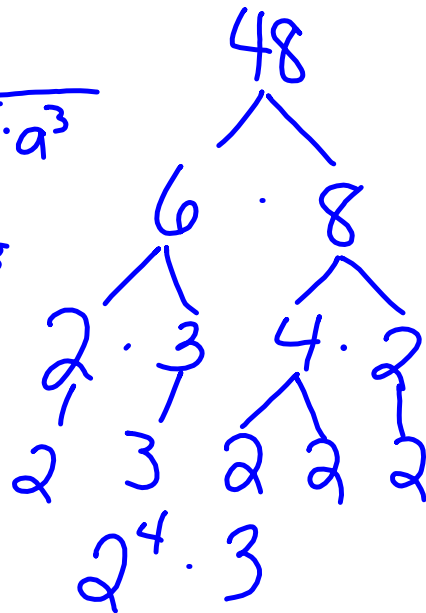
$$2\sqrt{48a^3}$$

$$2\sqrt{2^4 \cdot 3 \cdot a^3}$$

$$2 \cdot 4\sqrt{3a^3}$$

$$8\sqrt{3a^3}$$

$$8a\sqrt{3a}$$



$$\sqrt{28a^2b^3d}$$

$$\begin{array}{c} 4 \cdot 7 \\ \swarrow \searrow \\ \textcircled{2 \cdot 2} \cdot 7 \end{array} \quad \textcircled{a \cdot a} \cdot \textcircled{b \cdot b} \cdot b \cdot d$$

$$\cancel{2} \cdot 7$$

$$2\sqrt{7} \quad 2ab\sqrt{7bd}$$

$$\sqrt[3]{48a^3}$$

48

24 (2)

(2) 12

(2) 6

(2) 3

(2) 2 (2) 2 (2) 3

$2 \cdot 2 \sqrt[3]{3}$

$4 \sqrt[3]{3}$

$4a \sqrt[3]{3a}$

$a \cdot a \cdot a$

$$\begin{aligned}\sqrt{3} + \sqrt{27} \\ \sqrt{3} + \sqrt{9 \cdot 3} \\ \sqrt{3} + 3\sqrt{3} \\ 4\sqrt{3}\end{aligned}$$



# Assignment:

Textbook p256

6-24 all